

July 9, 2021

Rajinder Sahota
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Lucid Comments on Scoping Plan Kickoff Workshop

Dear Ms. Sahota:

Lucid Motors appreciates the opportunity to comment on the development of CARB's Carbon Neutrality Scoping Plan. We are a California-based electric vehicle manufacturer, with headquarters in Newark, CA, and this year will bring to market the Lucid Air – the world's most powerful and efficient electric sedan, with a projected range exceeding 500 miles, the fastest recharge speed in the industry (350 kW), and anticipated vehicle-to-grid capability. We have a clear vision for transitioning our market-leading technology to mainstream market segments and other transportation segments. Importantly, our technology leadership – especially on efficiency – will be key to enabling electrification of heavy-duty sectors and unlocking low-cost, mass market, uncompromising electric vehicles to enable the complete and quick transition to zero emissions transportation.

We look forward to working collaboratively with CARB, other stakeholders, and those throughout the Administration as an active partner to quickly accelerate the market for electric transportation in California and beyond – including through the Scoping Plan process, Advanced Clean Cars II (ACC II) rulemaking process, and other forums.

CARB's Objective and ZEV Policies Should Focus on Maximizing Cumulative Sales of ZEVs

We fully support Governor Newsom's Executive Order, including the requirement for all new passenger cars and trucks to be zero emission vehicles (ZEV) by no later than 2035. This directive is both visionary and necessary to address public health, climate change, and equity. However, CARB's approach in the Scoping Plan and ACC II rulemaking should not just focus on achieving the endpoint identified in the Executive Order, but also on maximizing ZEV sales cumulatively from now on – and specifically with an eye towards maximizing ZEVs on the road in 2030 and every year thereafter to meet the state's SB 32 climate target, federal air quality requirements, and carbon neutrality as soon as possible.

The ACC II Proposal Falls Short of Sales Needed to Achieve State's Air Quality and Climate Objectives

California's prevailing climate and air quality obligations occur in the 2030/2031 timeframe, ahead of the proposed 100 percent ZEV sales target set by the Governor's Executive Order. Achieving air quality and climate objectives therefore requires focusing not just on the endpoint

of the transition to ZEVs in 2035, but on every year ahead of that. To both develop the market rapidly to levels needed to achieve 100 percent ZEV sales within 15 years and to address air quality, climate change, and equity – the shape and framework of the ACC II rules in 2026-2030, and their impact on the market in 2021-2025, is far more critical to advancing state priorities than is the pathway beyond 2030 to ultimately get to 100 percent.

The proposed stringency of the ACC II rule presented at the May workshop falls short of the potential to quickly transition to ZEVs in the light-duty sector and the need to do so in order to meet the State’s climate and air quality objectives. CARB has already established the ZEV sales trajectory needed in the light-duty sector to meet these in the 2020 Mobile Source Strategy, which we appreciate was featured in the Scoping Plan kickoff workshops.

Compared to the level of need identified in the Mobile Source Strategy, we estimate the ACC II proposal would lead to more than 3 million fewer ZEV sales in the State through 2030 (see Table 1 below). The overall greenhouse gas emissions impact of this difference would be over 100 MMTCO₂,¹ equivalent to more than 15 percent of all greenhouse gas emissions reductions expected from 2021-2030 and nearly half the reductions expected from the State’s Cap-and-Trade Program over that timeframe.²

Table 1. Comparison of 2021-2030 ZEV sales under Mobile Source Strategy and ACC II proposal.

	Mobile Source Strategy		Advanced Clean Cars II		
	ZEV Sales Fraction	ZEV sales	ZEV Sales Fraction	ZEV sales	ZEV sales minus credit bank (15%)
2021	15%	323,763	12%	255,074	255,074
2022	21%	450,637	15%	313,259	313,259
2023	28%	577,511	18%	371,444	371,444
2024	34%	704,385	20%	429,629	429,629
2025	40%	831,259	23%	487,815	487,815
2026	46%	958,133	26%	546,000	464,100
2027	52%	1,085,007	34%	714,000	606,900
2028	58%	1,211,881	43%	903,000	767,550
2029	64%	1,338,755	51%	1,071,000	910,350
2030	70%	1,465,629	60%	1,260,000	1,071,000
Total		8,946,960			5,677,121

* Assumes 2.1 million overall light-duty vehicle sales per year

* ZEV sales fraction for ACC II from 2021-2025 interpolated from 2020 and 2026 values

* Cumulative ZEV sales do not account for fleet turnover and do not reflect expected vehicles on the road in 2030, which the Mobile Source Strategy estimates would be about 8 million ZEVs.

¹ Assuming a vehicle will travel 200,000 miles over its lifetime and the difference in well-to-wheels emissions between the average conventional vehicle and average ZEV sold from 2021-2030 is about 160 gCO₂/mile, as assumed in the Mobile Source Strategy.

² CARB (2017) California’s 2017 Climate Change Scoping Plan, November.

https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf

The Carbon Neutrality Scoping Plan Should Include ACC II as a Critical Measure and at Levels Needed to Meet the State’s Climate and Air Quality Goals

Achieving the mandated 2030/31 climate and air quality targets, as well as the broader objective of carbon neutrality as soon as possible, requires selling as many ZEVs as quickly as possible. Indeed, the difference between a regulatory pathway that achieves 8 or 9 million ZEVs in 2030 and one that achieves 5 million ZEVs in 2030 could easily be the determining factor in whether the state achieves its statutory 2030 climate targets.

In order to achieve the level of sales identified in the Mobile Source Strategy, while accounting for an assumed 15 percent credit bank suggested in the ACC II proposal, the proposed regulation would have to double in initial stringency to require 52 percent ZEV credits by 2026 and increase to 80 percent by 2030 and 100 percent by 2035 (compared to the May ACC II proposal of 26 percent in 2026 and 60 percent in 2030).

In developing the Scoping Plan, we encourage CARB to carefully consider the level of ZEV sales needed to meet the State’s climate targets, which at a minimum should align with the Mobile Source Strategy, and work with the ACC II team to ensure the regulation delivers the level of ZEV sales and emissions reductions needed to meet the State’s climate and air quality goals in the near and longer term.

ZEVs Provide Technologically Feasible and Cost-Effective Greenhouse Gas Reductions

CARB’s charge under AB 32 is to pursue the maximum technologically feasible and cost-effective greenhouse gas reductions, and under the carbon neutrality Executive Order it is to achieve carbon neutrality as soon as possible. Both directives argue for moving even more quickly than sales trajectories identified in the Mobile Source Strategy or in Governor Newsom’s ZEV Executive Order.

Research from the University of California’s Institute of Transportation Studies as part of the State’s carbon neutrality planning shows that meeting the Governor’s Executive Order for light duty vehicles will save Californians nearly \$150 billion through 2045.³ Another recent report by UC Berkeley corroborates these finds and goes even further, finding that achieving 100% zero emission car and truck sales nationally by 2035 would save consumers \$2.7 trillion through 2050 and create an additional 2 million jobs by 2035.⁴

Neither analysis accounts for the downward pressure the transition to zero emission vehicles will put on global oil prices, which will lead to significant additional savings for Californians, including drivers of older and conventional vehicles – who may be lower income or otherwise slower to adopt ZEVs. One study that tried to account for these benefits, for example, found that continuing efforts to push vehicle efficiency and electrification would reduce global oil

³ Brown, A. et al (2021) Driving California’s Transportation Emissions to Zero, University of California Institute of Transportation Studies, April. <https://escholarship.org/uc/item/3np3p2t0>

⁴ <https://www.2035report.com/transportation/>

prices by 9 percent in 2030, 24 percent in 2040, and 33 percent in 2050.⁵ A similar analysis in the World Energy Outlook Companies finds similar, but even greater, cost reductions.⁶

To the extent ZEVs are widely expected to achieve cost parity in many segments in the coming years, and therefore represent negative-cost climate solutions, pushing harder and faster on ZEVs will likely represent one of the most cost-effective climate solutions for California to achieve its climate and air quality targets – in 2030 and beyond.

Responses to Example Questions for Transportation Sector

In addition to these high-level comments and recommendations, we appreciate the questions posed in the transportation sector workshop, and offer comments on some of them for your consideration.

Where should we focus public investment to help facilitate the transition to transportation electrification?

We believe public funding is best used to support clear and lasting market conditions that affect and accelerate private sector investments from automakers, charging companies, fleet operators, and others. This may include clear, long-term and lasting incentives for vehicle purchases or infrastructure, financial mechanisms to provide greater certainty on the value of LCFS credits and total cost of ownership, and targeted investments to overcome market barriers that may exist on geographical, sectoral, or socioeconomic bases.

Public investment should align around the objective of ensuring that ZEVs serve as no-compromise vehicles that can replace a household's primary vehicle and serve all commutes and use cases. Quickly achieving this outcome is the only way to completely transition the transportation sector to ZEVs. Public investments should also support value-added attributes of ZEVs, such as vehicle-grid-integration, to further enhance the customer proposition and value to the ZEV ecosystem to accelerate sales.

While it's not the only needed charging solution, public investment in fast charging should increasingly focus on higher speeds, including 350 kW chargers. Many automakers are moving to 800+ V architectures to accommodate this level of charging, and faster charge times will increase the range and functionality of ZEVs, especially for residents living in multiunit dwellings or who may not otherwise have access to charging at home. Faster charging also enables a single charger to serve more vehicles, which reduces the overall number of chargers and investment needed to support the State's transition to ZEVs.

How do we ensure that low-income residents have equal access to affordable clean vehicles and refueling infrastructure?

⁵ https://theicct.org/sites/default/files/publications/Oil%20Market%20Futures_Summary_US_June%202016.pdf

⁶ Ibid.

We support targeted incentives, including low-income adders in CVRP, to help low-income residents get into ZEVs. However, an incentive program can only go so far. A complete solution to ensure equal access to affordable ZEVs and infrastructure requires market-wide solutions. CARB can deploy these solutions and ensure these outcomes through the ACC II rule, with no additional public funding, by doing the following:

- **Set strong, near-term ZEV credit requirements**, at least in-line with required sales levels identified in the 2020 Mobile Source Strategy, and which require automakers to more quickly design no-compromise ZEV products for the entire market.
- **Ensure that ZEVs, in all vehicle classes, offer no-compromise alternatives** to conventional vehicles by requiring minimum range of at least 350 miles and fast recharge capabilities of 350 kW. This will support drivers with longer commutes and those who live in multi-unit dwellings or don't otherwise have access to home charging.
- **Require and reward high levels of efficiency in ZEVs**, just like for conventional vehicles. Vehicle efficiency has the same impact on ZEV costs as battery prices do, and ultimately, high efficiency and low battery prices are both required to achieve low-cost, fully functional ZEVs (see Table 2).

Table 2. Battery pack costs for 350-mile range ZEV, based on efficiency and battery costs.

Battery costs (\$/kWh)	Efficiency (miles/kWh)				
	2	3	4	5	6
140	\$ 24,500	\$ 16,333	\$ 12,250	\$ 9,800	\$ 8,167
120	\$ 21,000	\$ 14,000	\$ 10,500	\$ 8,400	\$ 7,000
100	\$ 17,500	\$ 11,667	\$ 8,750	\$ 7,000	\$ 5,833
80	\$ 14,000	\$ 9,333	\$ 7,000	\$ 5,600	\$ 4,667
60	\$ 10,500	\$ 7,000	\$ 5,250	\$ 4,200	\$ 3,500

CARB should set minimum requirements for ZEV efficiency and reward superior efficiency through a credit multiplier. Just like for conventional vehicles, ensuring high ZEV efficiency will also minimize energy requirements to power ZEVs and associated emissions, while advancing national security by reducing the need for critical minerals and other materials.

- **Provide a small, but important, credit multiplier for low-cost and highly efficient ZEVs**, which will provide an implicit, and potentially significant, subsidy supporting ZEVs at the lower end of the market.
- **Create a GHG/ZEV undercompliance mechanism**, akin to the GHG/ZEV overcompliance mechanism in the original Advanced Clean Cars regulation, but where conventional vehicles with greenhouse gas emissions above required fleet-average levels generate

incremental ZEV credit requirements. This would create a feebate-type structure where sales of the highest polluting vehicles support sales of additional ZEVs, potentially at the lower end of the market.

- **Ensure a broadly competitive, innovative and robust ZEV credit marketplace**, by encouraging but limiting ZEV credit trading, so that all automakers must generate some portion of their own ZEV credits and no single automaker may dominate ZEV credit sales. This will ensure that all automakers – new and old alike – are investing in ZEV development, increasing competition and accelerating innovation.
- **Resist calls for partial solutions in the name of equity**, including less ambitious standards or support for plug-in hybrids or ZEVs with lower functionality, including shorter range or slower charge times. These outcomes would actually move us in the opposite direction. The best way to ensure equity is to push all automakers to quickly deploy more, better and cheaper ZEVs.

How closely should reduction in demand for petroleum fuels match reduction in supply? Should we be concerned about increased crude imports if we don't phase down supply and demand in a coordinated plan?

We don't have specific comments on petroleum supply issues in California, but note that plug-in hybrids are incompatible with both the Governor's Executive Order and the objective of phasing down petroleum demand and supply. Achieving a 100 percent transition to ZEVs requires quickly developing mass-market, cost-effective, no-compromise ZEVs and the infrastructure to support them. That should be California's near-term and ongoing focus, and achieving those outcomes would eliminate both petroleum demand in the transportation sector as well as the rationale for plug-in hybrids themselves.

Coordination is Key

We encourage you and CARB's Scoping Plan team to coordinate closely with the ACC II and Mobile Source Strategy teams to ensure that this important regulation aligns with the Scoping Plan and State's greenhouse gas targets for 2030 and achieving carbon neutrality.

We appreciate your consideration of these comments and proposals, and look forward to the opportunity to continue working with CARB through the Scoping Plan and ACC II rulemaking processes to rapid, equitable transitions to 100 percent ZEVs.

Sincerely,

Daniel Witt
Public Policy Lead
Lucid Motors